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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/327,621 | 06/08/1999 | HIROTO HORIKAWA | 101809.03 | 5673 |

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OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER

KIM, PETER B

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|----------|--------------|
| ART UNIT | PAPER NUMBER |
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2851

DATE MAILED: 03/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/327,621

Applicant(s)

Horikawa

Examiner

Peter Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Jan 2, 2002
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26-94 and 97-104 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 26-37 is/are allowed.
- 6) ☒ Claim(s) 38-94 and 97-104 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 08/935,445.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 21
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

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DETAILED ACTION

1. Applicant's arguments filed on 1/2/02 (paper #21) have been fully considered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 38-45, 54-94 and 97-104 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishi in view of Negishi.

Nishi discloses in Figures 1 and 2 and column 8, line 14 through column 10, line 4, a projection exposure apparatus with a base (ref. 19) which holds the scanning stage (ref. 20) and the fine adjustment stage (ref. 21) which holds the mask (ref. 7) and movable mirror (ref. 33, 34A, 34B) for laser interferometers (ref. 35, 36A, 36B) which detect a displacement of the fine adjustment stage. Nishi also discloses the illumination system (ref. 22), projection optical system (ref. 13), substrate (ref. 14) and substrate stage with movable mirror and laser interferometer. Nishi also discloses driving the fine adjustment stage to prevent a positional error when the scanning stage is accelerated or decelerated (col. 13, line 28-60). Although Nishi does not disclose the substrate located on the fine adjustment stage and the scanning stage, it would have

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been obvious to one of ordinary skill in the art at the time of the invention to provide the substrate stage with such an arrangement. Nishi discloses a means for moving the stage but Nishi does not disclose electromagnetic actuators. Negishi discloses in Figures 1-4 and column 3, line 20 through column 7, line 35, electromagnetic actuators for moving the scanning stages of an exposure apparatus in x- and y-directions. Negishi discloses the stationary member having a coil of the electromagnetic actuator located on the stationary base relative to the moving stage and the movable magnetic portion located on the moving stage. Negishi also discloses cooling unit that cools the stationary member of the electromagnetic actuator. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the base for holding the scanning and fine adjustment stages and the electromagnetic actuators and the cooling unit in view of Negishi to the invention of Nishi in order to more efficiently produce semiconductor elements or liquid crystal display element which is well known product of scanning exposure apparatus.

4. Claims 46-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishi (5,477,304) in view of Novak et al. (Novak) (5,623,853).

Nishi discloses in Figures 1 and 2 and column 8, line 14 through column 10, line 4, a projection exposure apparatus with a base (ref.19) which holds the scanning stage (ref. 20) and the fine adjustment stage (ref. 21) which holds the mask (ref. 7) and movable mirror (ref. 33, 34A, 34B) for laser interferometers (ref. 35, 36A, 36B) which detect a displacement of the fine adjustment stage. Nishi also discloses the illumination system (ref. 22), projection optical system

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(ref. 13), substrate (ref. 14) and substrate stage with movable mirror and laser interferometer.

Although Nishi does not disclose the substrate located on the fine adjustment stage and the scanning stage, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the substrate stage with such an arrangement. Nishi discloses a means for moving the stage but Nishi does not disclose electromagnetic actuators and cooling means of liquid. However, Novak discloses Novak discloses cooling unit that cools the stationary member of the electromagnetic actuator which are arranged in the direction perpendicular to the scanning direction (col. 13, lines 50-65). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the cooling system of Novak to the invention of Nishi in order to protect the stage moving means from excessive heat.

Allowable Subject Matter

5. Claims 26-37 are allowed.

Remarks

6. Applicant argues that Negishi reference does not show the “second stage which moves in two perpendicular direction with respect to the first stage.” It is unclear what applicant means by *two perpendicular* direction with respect to the first stage. “Two perpendicular” direction seems to indicate that the second stage of Claim 38 is moved in a direction that is perpendicular to the

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first stage within the same plane and also in the vertical direction out of the plane, which is also a perpendicular direction.

Regarding the movement of the stage of Negishi, Negishi is secondary reference, on which it was relied to show electromagnetic actuators that drive the stage since Nishi reference already shows the first and the second stages as claimed.

Applicant also argues that Nishi does not teach driving the second stage while the first stage is accelerated or decelerated. However, Nishi does teach such method in column 13.

Applicant also argues that Novak does not teach, the cooling unit that circulates a cooling fluid from the actuators arranged in the direction perpendicular to the scanning direction. However, Novak teaches such recitation in column 13.

Regarding the inventorship, proper corrections have been made and Horikawa is identified as the sole inventor.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Kim whose telephone number is (703) 305-0105. The examiner can normally be reached on Monday-Thursday from 6:30 AM to 4:00 PM. The examiner can also be reached on alternate Fridays during the same hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams, can be reached on (703) 308-2847. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

PMK

PBK

03/8/02

Russell E Adams

RUSSELL ADAMS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800